Claims

We claim:

1. A method comprising the step of:

   monitoring a dynamic condition that causes transmission line impedance to vary;

   dynamically determining based upon the dynamic condition if a drive strength of a first output coupled to a first node is to be adjusted; and

   dynamically adjusting the drive strength of the first output when the step of determining indicates the first output is to be adjusted.

2. The method of claim 1 wherein:

   the step of monitoring the dynamic condition includes monitoring a first plurality of values to be provided substantially simultaneously in time to a plurality of first nodes that are adjacent to the first output; and

   the step of dynamically adjusting includes dynamically adjusting the drive strength of the first output based on the first plurality of values.

3. The method of claim 2, wherein the step of dynamically adjusting includes:

reducing the drive strength of the first output when a signal at the first output is transitioning from a first voltage level to a second voltage level and a majority of the plurality of first nodes is also transitioning from the first voltage level to the second voltage level.

4. The method of claim 3, wherein the majority of first nodes include immediately adjacent nodes.

5. The method of claim 4, wherein the majority of first nodes include two immediately adjacent nodes.

6. The method of claim 2, wherein the step of dynamically adjusting includes:

increasing the drive strength of the first output when a signal at the first output is transitioning from a first voltage level to a second voltage level and a majority of the plurality of first nodes is transitioning from the second voltage level to the first voltage level.

7. The method of claim 1, further comprising the steps of:

dynamically determining based upon the dynamic condition if an output drive strength of a second output coupled to a second node is to be adjusted, wherein determining if the output drive strength of the second output is to be adjusted is independent of determining if the output drive strength of the first output is to be adjusted; and

dynamically adjusting the drive strength of the second output when the step of determining indicates the second output is to be adjusted.

8. The method of claim 7, wherein:

the step of monitoring the dynamic condition includes monitoring a first plurality of values to be provided substantially simultaneously in time to a plurality of first nodes that are adjacent to the first output; and

the step of dynamically adjusting includes dynamically adjusting the drive strength of the first output based on the first plurality of values.

9. The method of claim 8 wherein:

the step of monitoring the dynamic condition includes monitoring a second plurality of values to be provided substantially simultaneously in time to a plurality of second nodes that are adjacent to the second output; and

the step of dynamically adjusting includes dynamically adjusting the drive strength of the second output based on the second plurality of values.

10. The method of claim 9, wherein the nodes of the plurality of first nodes are mutually exclusive of the nodes of the plurality of second nodes.

11. The method of claim 9, wherein the plurality of first nodes includes the second node.

12. The method of claim 11, wherein the plurality of second nodes includes the first node.

13. The method of claim 11, wherein the first node is immediately adjacent to the second node.

14. The method of claim 1, wherein the step of dynamically determining includes determining for each transition of the first output if the output impedance of the first output is to be adjusted.

15. The method of claim 1 wherein:

the step of monitoring the dynamic condition includes monitoring a first plurality of values provided sequentially in time to the first output; and further including

the step of dynamically adjusting includes dynamically adjusting the impedance of the first output based on the first plurality of values.

16. The method of claim 2, wherein the step of dynamically adjusting includes:

increasing the drive of the first output when a signal at the first output is transitioning to a first voltage after having been at a second voltage state for two or more data cycles.

17. A method comprising the steps of:

monitoring a bit pattern set associated with a first output;

dynamically determining based upon the bit pattern set if an output impedance of the first output is to be adjusted; and

dynamically adjusting the impedance of the first output when the step of determining indicates the first output is to be adjusted.

18. The method of claim 17 wherein the steps of dynamically determining and dynamically adjusting occur in real-time.

19. The method of claim 17 wherein the steps of dynamically determining and dynamically adjusting occur for each output cycle of the first output.

20. The method of claim 17 further comprising the step of:

providing to the first output a representation of a portion of the bit pattern set after the step of dynamically adjusting the impedance.

21. The method of claim 17, wherein the first output includes an output bus having a plurality of output drivers.

22. The method of claim 21, wherein the step of dynamically adjusting includes adjusting the impedance of each of the plurality of output drivers independent of the impendence of each of the other plurality of output drivers.

23. The method of claim 21:

wherein the bit pattern set includes at least one serial bit pattern subset, wherein a serial bit pattern subset includes a plurality of data bits to be provided to one of the plurality of output drivers in a time sequential manner.

24. The method of claim 23 wherein:

the bit pattern set includes at least one parallel bit pattern subset, wherein a parallel bit pattern subset includes a plurality of data bits that are provided to a plurality of output drivers during a common output cycle.

25. The method of claim 24, wherein the step of dynamically adjusting includes:

dynamically adjusting the impedance of the first output based upon the serial bit pattern subset and the parallel bit pattern subset when the step of determining indicates the first output is to be adjusted.

26. The method of claim 24, wherein the plurality of output drivers is immediately adjacent output drivers.

27. A method comprising the steps of:

monitoring a bit pattern set, wherein the bit pattern set is to be provided at an output node; and

adjusting an impedance of the output node based upon the bit pattern set.

28. The method of claim 27, further comprising the step of:

determining a depth of the bit pattern set.

29. The method of claim 28, wherein the depth of the bit patterns set is at least partially determined by the length of a line to be connected to the output node.

30. A method comprising the steps of:

monitoring a bit pattern set, wherein the bit pattern set is to be provided in parallel to a plurality of output nodes; and

adjusting an impedance of a first output node of the plurality of output nodes in a first manner based upon the bit pattern set.

31. An apparatus comprising:

a storage element having an input and an output, the storage element for storing a bit pattern set associated with output values; and

a dynamic drive controller having an input coupled the input of the storage element, and an output, wherein a drive strength at the output is based upon the bit pattern.

32. The apparatus of claim 31, wherein the bit pattern is associated with values that are output in parallel.

33. The apparatus of claim 32, wherein the bit pattern is associated with values that are output in serial.

34. The apparatus of claim 31, wherein the bit pattern is associated with values that are output in parallel.